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Emergency Slaughter and Malignant Neoplasia (Bovine) *

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DUBLIN

EMERGENCY SLAUGHTER

When I was requested to present a paper to this meeting I was in a bit of a quandary to know what aspect of meat inspection would appeal to the greater number of those present and particularly to the general practitioner. I finally decided on the above because in my opinion the veterinarian who can give a proper judgment in the case of the emergency slaughtered animal is more competent to deal with the normal routine inspection. At the abattoir we have always encouraged both students and recent graduates to see as much as possible of this type of inspection. All public abattoirs should have a separate slaughterhouse for handling the "emergency animal" on similar lines to those at the Dublin Abattoir. It would be a further advantage to have the laboratory included in this building.

In dealing with emergency slaughter I have avoided reference to any of the standard text-books because, so far as I am aware, there are none which deal with this subject as a separate entity, to which treatment I think it is entitled. I will attempt to define emergency slaughter as: "The attempted salvage as the result of accident, injury or disease, of the flesh of an animal, commonly used for the food of man."

The "emergency slaughter" animal may enter the abattoir:—

(1) Dead and either unbled or bled.

(2) Dead and paunched; in this case the animal has been bled on the farm either before or after death and the viscera have been removed but the skin or hide has not been interfered with.

(3) Alive; and this is the way we like to see it.

(4) As two sides or, more commonly, as four quarters in the case of beef or as a body or carcase in the case of mutton or pork, having been slaughtered and dressed on the farm or in a convenient slaughterhouse.

I will now consider these different headings:—

(1) Dead unbled or bled. Before attempting to handle the animal or allow its removal from the vehicle in which it arrived we must first eliminate anthrax. At the abattoir we simply remove an ear, the underneath one for preference, make a blood smear and stain with methylene blue. In the case of a bled animal one may have difficulty in obtaining blood from the ear and it will be more satisfactory to take blood from a vein close to where the throat has been cut.

The object in leaving the animal in the vehicle is to reduce the risk of contamination, as in the event of it turning out positive for anthrax, the carcase can be immediately removed to the knacker's for destruction with less risk of spreading infection.

In the case of the pig, as you are aware, blood examination is not of much value and in this case we examine the throat for swelling and if present make smears from the exudate. Having eliminated anthrax we allow a butcher to dress the carcase. It is a great advantage to be present if possible during this procedure.

I will now refer to the general observations to be noted in examining the "emergency animal." We observe the sex (bull, bullock, heifer, cow) and the condition (good, fair or wasted). We note the position of the limbs—whether they are easily flexed or rigid: perhaps they may show irregular contraction, one leg drawn up and the other extended. As regards regular contraction, at the abattoir we frequently find that animals arriving in a moribund state stiffen immediately after slaughter. This applies to both cattle and sheep, particularly those suffering from digestive troubles and which have been generously dosed with medicine. We observe how the animal has bled, whether the carcase is tympanitic, which is indicative of putrefaction, as also of certain diseases. In sheep, if the animal has been bled some hours, the wool is easily removed and if this is accompanied by tympany it is uneconomical to dress the carcase as the salvage of the skin would not pay the cost of dressing.

The butcher may state that the hide is sticky—not easily removed. This, in an animal a short time dead, suggests that it has been severely purged with consequent dehydration of the tissues and, in such cases, the animal does not, as a rule, bleed well and the blood is usually darker and thicker than normal. We watch the viscera as they are removed and, if the animal has recently calved, note the condition of the uterus—whether there is evidence of sepsis, and whether it has contracted or is enlarged and flaccid. In acute septic metritis the uterus, as a rule, does not contract, or only slightly, and is full of foul-smelling discharge of a grey or reddish brown colour. If the animal has been sent in on account of difficult parturition or inability to calve, one should observe the condition and position of the foetus, and whether it has been dead for some time—as evidenced by the presence of emphysema and decomposition accompanied by a septic condition of the womb.

I may here refer to discoloration of the fat and tissues in the pelvic cavity. This is invariably due to one of the three following causes: (1) fracture of the pelvis, probably the most common cause; (2) difficult parturition; (3) septic metritis. It is well to remember this, particularly where one has to examine a carcase sent in without the viscera.

The mammary gland and its associated lymphatic glands are examined for tuberculosis, mastitis, etc. Acute septic conditions of the uterus or udder are particularly dangerous and should on no account be treated with leniency.

The stomach and intestines are inspected for evidence of inflammation, petechiae, etc., also adhesions and thickening which are not uncommon in actinomycosis of the reticulum. The gut is sloppy in appearance in the wasted animal, in enteric conditions and after large doses of purgative medicines. (I may remark that the normal colour of the mucous membrane of the abomasum is pink and one might mistakenly think that it is inflamed.)

We examine the mesenteric glands and observe if they are enlarged, swollen or haemorrhagic, as may occur in acute infections, and look for the presence of tuberculosis, which is not to be confused with lesions of pentastoma—small greenish or brownish lesions which are easily enucleated and which are frequently found in young cattle. One should observe whether there is an abnormal amount of food in the rumen, whether the mucous membrane is easily detached (as occurs in decomposition) and if the omasum is very firm and hard as in atony and impaction.

The liver and portal glands are examined; the organ is congested in badly bled carcases. We note evidence of disease, *e.g.*, tuberculosis, tumours, abscesses, degenerations, etc. It may be enlarged or show evidence of cloudy swelling, as indicated by a pale terra cotta colour. I may remark here that, so far as I am concerned, I cannot definitely distinguish between a fatty degeneration and a fatty infiltration. The latter is a normal condition in the later stages of pregnancy, but I invariably seize the organ where its colour is markedly changed. Next the spleen is examined for enlargement, disease, etc. The lungs and heart are examined, multiple incisions being made in the bronchial and mediastinal glands, and the lung substance palpated. I prefer this to incision as frequently blood rushes over the cut surface and may occlude small lesions of disease. The pericardium is incised and where considered necessary the ventricles should be opened. Prior to this the head and tongue should have been examined for evidence of injury or disease, such as actinomycosis, tuberculosis and foot-and-mouth disease. The retro-pharyngeal and the submaxillary lymphatic glands and, if necessary, the subparotid, should be incised. It may be necessary, from the *ante-mortem* symptoms, to examine the brain. This is frequently exposed by the porter in removing the head from the carcase. When the carcase is split the serous membranes are examined for evidence of tuberculosis, abscesses, adhesions, decomposition, etc. The sternum and spine should not be forgotten as one may otherwise easily miss a lesion of tuberculosis, particularly in a young animal. If decomposition is advanced it will have already been noted during the removal of the viscera on account of the offensive odour and the greenish discoloration of the omentum and mesentery. This discoloration will be particularly noticed on the kidney fat and the parietal peritoneum; the diaphragm will be soft and flaccid and lie close against the ribs. In such a case there is no need to waste any more time as the carcase is obviously unfit for human consumption and should be seized.

If, however, the animal shows no evidence of disease in the viscera and has been slaughtered as the result of accident or injury and the viscera have not been in the animal more than an hour, the carcase would probably be passed. In the ox and sheep the

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time factor will, of course, depend on weather conditions and even half an hour in very warm weather may be sufficiently long to lead to decomposition changes.

In early decomposition we note a slight greyish discoloration or staining on the peritoneal surface of the diaphragm. In this case one should always detain the carcase for twelve hours before giving a decision. We may then note that the greyish discoloration of the night before has changed to a greenish tinge which will justify the seizure of the carcase. We should also note how the carcase sets and look for evidence of injury or enlarged joints, glands, etc. If we judge the setting of a carcase in the usual way, by attempting to lift the shoulder, we may find that it is quite firm because in a well-nourished carcase this will depend in great measure on the setting of the fat in the axilla and is not absolutely indicative of the condition of the meat; these carcases should always be quartered and, if necessary, ribbed as well, *i.e.*, the fore quarters re-quartered. On examination of the carcase that appears to have set well it may be found that the cut surfaces of the meat are quite soft to the touch and pit easily on pressure; the meat may be darker than normal or, in some cases, paler in colour and changing to a bright red on exposure. One should note the colour of the fat for evidence of jaundice, which is most commonly seen in redwater. If the carcase sets well, the meat is firm and the only evidence of decomposition is a slight geyish discoloration of the diaphragm, and if the animal was slaughtered as the result of an accident, or perhaps went wild and had to be destroyed, the carcase may be safely passed, less the injured parts; if jaundiced it should be seized.

Everything I have remarked in the foregoing will apply to condition No. 2—dead and paunched animal. Here we have no viscera to guide us, although the lungs and heart are sometimes not removed; however, in the main, we have to judge the carcase on its merits. As a general rule the carcase has been badly paunched, very likely the pleura and the peritoneum are soiled with blood and stomach contents. The skin may have been left on for some time; its removal will be difficult and the effect of leaving it on causes the subcutaneous tissues to appear paler (whiter) than normal. As a result the carcase is unable to cool out properly and, as a rule, does not set well; the fore legs are ill-set and move freely on the shoulder blades and generally show irregular contraction. On quartering, the meat is unset, soft and doughy and pits on pressure; the carcase may or may not bleed well. In the latter case the superficial and intercostal veins are engorged and stand out prominently. As a general rule the condition of these carcases justifies condemnation.

Condition No. 3. In this case the animal arrives alive but may be in a moribund state. It is, therefore, a great advantage to see the animal before slaughter. We note its position in the vehicle: it may be lying down quite normally as is frequently seen in injuries, fractures of the limbs, etc., or it may be stretched out in a moribund state. We may make enquiries from the owner or his servant as to why the animal is being slaughtered, but here I may remark that one cannot, as a rule, place much reliance on the history given. We observe how the animal walks, if it is capable of so doing. It may show inco-ordination which leads us to suspect spinal tuberculosis. If the animal is stretched out in the float, eyeballs rolling, limbs rigid, we suspect tuberculous meningitis; both of these conditions are frequent causes of emergency slaughter. If the animal is unable to walk it should be stunned with the humane killer before removal from the float in order to avoid unnecessary suffering.

Pelvic fracture is responsible for a great number of cases of emergency slaughter and here it will be noted that, as the carcase is turned on its back prior to dressing, the affected leg or legs drop out at right angles. I have often wondered if this would be useful to the practitioner in diagnosing the condition in a live animal. During bleeding we note the condition of the blood—whether it is darker, thicker or paler in colour and more fluid than normal. In very severe injuries or bruising, and after large doses of purgatives, the blood is thicker and more viscous than normal, whereas in anaemia and other diseases of the blood, *e.g.*, redwater, it is thin and watery in appearance. The carcase of an animal affected with redwater will appear well bled even when it has not been bled at all. Moribund animals do not, as a rule, bleed well. The superficial and the intercostal veins being congested, the carcase looks red or fiery, the viscera are congested and show all the appearance of the text-book fevered carcase, although the animal may have had a subnormal temperature. On the other hand an animal which *ante-mortem* examination shows to be highly fevered may bleed and set well although the internal organs show all the evidence of fever, *e.g.*, cloudy swelling, etc.

Our judgment of these carcases will depend on:—

1. The bleeding of the carcase.
2. The setting of the carcase.
3. The condition of meat after quartering—whether it is firm and of good colour.
4. The colour of the fat and serous membranes—absence of jaundice, melanosis, etc.

If the carcase fulfils these conditions and the *ante-mortem* appearance was satisfactory, we may safely pass it as fit for human consumption, provided that where disease is found it is not of a severe toxaemic or sapraemic nature, *e.g.*, traumatic pericarditis, acute septic mammitis or metritis, which are particularly dangerous conditions. I have not referred to the judgment of the animal slaughtered in emergency on account of tuberculosis as you have the "Veterinary Inspection 1929 Order" to guide you. However, in all doubtful cases the consumers should get the benefit and the carcase should be seized. Injured animals are, as a rule, passed after removal of the damaged parts. Animals trampled on in transit are frequently seized as the injuries are in such cases usually of a very severe nature.

Condition No. 4. Animal slaughtered on farm or in an adjacent slaughterhouse and sent to the abattoir as dressed meat.

We must first eliminate anthrax unless provided with a reliable history or a veterinary certificate accompanies. Here I would warn veterinary surgeons to be very careful when giving certificates, as on a few occasions I have unfortunately been obliged to condemn carcases so certified.

Naturally if the animal was slaughtered on account of an accident it will probably pass, provided it has been well butchered and has set well. If meat is canvassed a short time after slaughter, before it has had time to cool, and sent a long distance by rail, it will certainly arrive in a deplorable state. It will be unset, *rigor mortis* having been interfered with. Frequently it has been badly soiled owing to picking up dirt in transit or having been covered with soiled canvas.

The carcase is inspected for evidence of injury or disease; the condition of the pleura and peritoneum is noted for adhesions, stripping, tuberculosis, putrefaction, etc. It is very important to examine the spine for evidence of tuberculosis and this applies particularly to young animals. The carcase lymphatic glands should be incised and the kidneys exposed. We note the condition of the meat—whether it is firm and springy or soft and doughy. We examine the fat for evidence of jaundice, etc. In jaundice due to redwater, particularly in young animals, one need not expect to find the cartilages showing evidence of this condition, as I think most of our text-books suggest; rather do they stand out particularly white against the greenish yellow fat.

If the carcase on examination shows no evidence of disease and is bled and set well it should be passed. If it only shows evidence of injury and fulfils the aforementioned conditions it should be passed. In most other cases the conditions of the carcase will justify condemnation.

I shall now conclude this section with a record of some of the commoner cases as well as a few unusual cases which have been dealt with at the abattoir over a number of years. Finally, I would like to refer to the incidence of malignant neoplasia in the bovine in this country, with particular reference, where this was possible, to the county of origin.

Case Records

Case No. 1.—June, 1927. Cow alive, in poor condition. Age four to five years. On movement animal turned circular fashion towards the right with a tendency to stumble into objects; had been under observation at the Veterinary College. Carcase in poor condition and dropsical. Brain showed several small tuberculous lesions with caseous centres in left cerebrum (slight in right). The only other evidence of tuberculosis was in the left bronchial lymphatic gland. Prescapular glands were enlarged and oedematous. Condemned.

Case No. 2.—June, 1927. Heifer on foot. Poor condition. Chronic pneumonia of apical lobes of both lungs. Liver extensively affected with fluke. Petechiae studded over kidneys. Carcase glands oedematous. Condemned.

Case No. 3.—Cow alive. Sent in by Mr. H. O'Leary, M.R.C.V.S., as suffering from intermittent tympany—probably tuberculosis. Mediastinal glands enormously enlarged, mesenteric glands also tuberculous. Passed except for viscera.

Case No. 4.—June, 1927. Sheep alive. Poor condition. Mammitis; udder lesions with greenish yellow purulent centres, similar lesions in popliteal and right prescapular glands. Caseous lymphadenitis of the type met with in this country and which I believe is due to *Bacterium purifaciens*. Condemned.

Case No. 5.—July, 1927. Cow alive. Recently calved. Arrived after working hours and, according to butcher, was in a moribund state. Carcase ill-bled, set well, superficial intercostal veins congested. Fiery or fevered in appearance. Udder affected with acute septic mammitis and commencing gangrene. Condemned.

Case No. 6 (*J. M. Murphy*).—Cow alive. Very sick. Exaggerated respirations and coughing badly. Tuberculous lesions in mediastinal and mesenteric glands. Lungs, very extensive pneumonia with evil smelling pus and large septic cavities in substance containing blood clots. Condemned.

Case No. 7.—Cow alive. Sent in by Mr. J. Flynn, M.R.C.V.S., under Bovine Tuberculosis Order (1926). Much oedema and induration of left side of udder which was a solid mass of tuberculous tissue. Extensively affected with tuberculosis. Condemned.

Case No. 8.—Cow died on way in. Blood examination negative for anthrax Animal had apparently great difficulty in breathing. Tracheotomy tube in neck, apparently a very long time—very dirty and clogged. Tuberculosis—left pharyngeal gland very much enlarged. Gangrenous tracheitis extending into lungs with gangrenous pneumonia. Bronchial and mediastinal glands enlarged and tuberculous, liver cloudy, spleen enlarged and congested. Carcase in very fat condition, but ill-bled. Condemned.

Case No. 9.—Cow alive but very dull. *Ante-mortem* temperature 103·8° F. Carcase in good condition, recently calved, bled well, uterus full of foul-smelling necrotic fluid. Chronic suppurative mastitis, liver cloudy. Condemned.

Case No. 10.—August, 1927. Live bullock observed by Mr. J. M., Murphy M.R.C.V.S., D.V.S.M., in float at Market. Animal very ill, with head out-stretched, mucous membranes icteric. Temperature 104° F. Carcase bled badly although it appeared well bled, blood anaemic and watery, lungs icteric and oedematous in part, liver enlarged and jaundiced, spleen enlarged, kidneys dark and congested (red-water). Condemned.

Case No. 11.—September, 1927. Pig dead and bled. Bled and set well, not long dead, very good sow. A piece of ox stomach fixed in larynx and apparently the cause of death. Passed.

Case No. 12.—September, 1927. Sheep dead and bled. Apparently not long dead. Spleen very enlarged, small circumscribed lesions in liver and kidneys, metastatic lesions in bronchial and mediastinal glands, probably adeno-carcinoma; later verified by Veterinary College. Condemned.

Case No. 13.—September, 1927. Sheep alive, unable to rise. Abscess in cervical spine, between meninges, similar lesion in right prescapular lymphatic gland, viscera perfectly healthy. Carcase in good condition, and passed save a short fore quarter.

Case No. 14.—March, 1928. Bullock alive. Good condition. Stated to have been burnt; large diffuse hard swelling over loins, skin enormously thickened and denuded of hair. Diffuse fibrous swelling over loins like actinomycosis, enlargement of precrural and iliac glands, remaining carcase glands normal. Passed except for sirloins and flanks.

Case No. 15.—April, 1930. Three pigs dead. Diffused reddening of skin, over head and ears of one pig. Ulceration of colon in all three pigs, petechiae in intestines, heart muscle and pericardium. Reported as suspected swine fever, and confirmed by Department. Condemned.

Case No. 16.—April, 1923. Heifer alive but unable to rise, sitting back on its hocks like a bear. Rupture of gastrocnemii muscles with bruising and haemorrhage in both legs. Passed except for affected parts.

Case No. 17.—May, 1926. Bullock under observation, Mr. S. O'Donovan, M.R.C.V.S., showing inco-ordination of movement. Extensively affected with tuberculosis. Lesions in dorsal region of spinal cord. Condemned.

Case No. 18.—Cow alive. Sent in by Mr. Daly, M.R.C.V.S., who suspected heart trouble. Animal very dull, oedema of dewlap, heart sounds thumpy, typical of traumatic pericarditis. Typical ragwort liver (fine cirrhosis), oedema of kidney fat and mucous membrane of abomasum, carcase in fair condition; fibrous growth with necrotic centres on the valves of heart. Microscopic examination at Veterinary College failed to reveal any organisms. Passed.

Case No. 19.—Bullock alive, very sick. Profuse lacrymation, tears running from eyes, mucous membranes injected. Very extensive peritonitis with ascites, liver enormously enlarged and cloudy, with numerous necrotic foci throughout substance. Apparently a case of acute infection with *B. necrosis*. Condemned.

Case No. 20.—Cow and calf. Attended by Mr. F. Daly, M.R.C.V.S. and Professor Craig, and believed to be suffering from ragwort poisoning. Liver showed typical cirrhosis; oedematous thickening, with petechiae, of abomasum. Passed.

Case No. 21.—Heifer alive, walked in. Carcase bled and set well. Muscles behind shoulder black in colour, on cutting into, spongy and crepitating, due to gas formation, apparently a case of black leg. Condemned.

Case No. 22.—September, 1942 (Mr. P. J. Nolan, M.R.C.V.S.). Two sheep alive in lorry, had been purchased about three months previously and remained in an unthrifty condition. One had a large growth, about the size of a boy's football, under the skin to one side of the vertebral column and extending over the middle ribs and a similar though smaller growth in the thoracic cavity more or less in the same position. Similar growths in the lungs and liver—probably sarcoma; later verified by Mr. Mullaney at the Veterinary College as a spindle celled sarcoma. The other sheep was down; age about three years, poor condition. Caseo-calcareous lesions in the bronchial, portal and mesenteric glands, also lesions in lungs and liver substance, renal glands affected; on splitting the carcase a lesion about the size of a shilling was found about the fourth or fifth dorsal vertebrae, probably tuberculosis. Biological test for tuberculosis on two guinea-pigs and two rabbits at Veterinary College—negative. Both carcases condemned.

Case No. 23.—November, 1942. Heifer alive in good condition. Paralysed, eyes protruding and swollen, with all the symptoms of brain trouble. Advanced tuberculosis, including tuberculous meningitis of brain and anterior part of spinal cord. Condemned.

Case No. 24.—1942. Five pigs alive and one dead and bled. These five pigs showed convulsions and rigors. All the animals had been fed on offal obtained from a certain factory engaged in the production of meat food products. This offal I understand was mainly composed of meat and meat extractives. Symptoms suggested brine poisoning. No evidence of disease. Dead pig ill bled, viscera congested, hard faeces in large intestine. Stomach engorged with food, slight enteritis. The owner was in the habit of mixing this food with brewers' grains, scalding the mixture and then covering it with a sack, but that on this occasion had failed to do so. Carcase condemned.

Case No. 25.—Heifer only a short time dead, said to have died in a motor lorry at the park gate. On removing an ear, the blood was seen to be fluid and normal in appearance and quite warm, ear muscles contracting, animal not removed from lorry. Blood examination, numerous rod-like organisms in short chains, fairly typical of anthrax. Reported to Department of Agriculture and confirmed.

Case No. 26.—Bullock alive but dull, slight swelling of sheath. Left kidney fatty, degenerated and oedematous, bladder very much inflamed, with numerous petechiae; small calculus about half the size of a pea in urethra at sigmoid flexure. Passed.

Case No. 27.—April, 1943. Cow, aged ten years. Condition good. Numerous circumscribed lesions under the skin of shoulders, ribs and legs and, on incision into muscles, similar lesions throughout the carcase. Bronchial, mediastinal, and portal glands tuberculous. Lesions in skin and muscles thought to be probably sarcoma. Specimen sent to Veterinary Colleges, reported by Professor Kearney to be a case of Roeckl's granuloma, a very rare condition. Condemned.

Case No. 28.—Bullock, aged three years. Condition good, dull in appearance. Bled and set well. Kidneys pale with numerous embolic abscesses. Large abscess on mitral valve. Several small abscesses deeply embedded in muscles of shoulders and on hind legs. Specimens sent to Veterinary College—report, streptococci. Condemned.

Case No. 29.—Sheep dead. Condition good. Carcase well bled, although throat had not been cut. Thorax was full of blood, due to rupture of the posterior vena cava where it passes between the lungs close to the vertebrae. Passed. I have seen several such cases and am inclined to believe that it is due to violence such as occurs when unloading sheep from a high lorry; the animals when thrown out land sometimes on their backs.

INCIDENCE OF MALIGNANT NEOPLASIA IN THE BOVINE AND ITS RELATIONSHIP TO THE COUNTY OF ORIGIN

I had originally intended to deal with each case separately, but this would take up too much time and I shall content myself by giving the total number of cases from the West of Ireland, which will include the counties of Mayo, Sligo, Leitrim, Galway and Roscommon, as compared with the other counties of Ireland. It will be noted that the incidence in the West is particularly high and although I have not been able in all cases to give the county of origin I believe most of them were from the County Mayo. I think it will be admitted that the soil in general in the West, with the exception of Roscommon and parts of Galway, is of poor quality, and this applies particularly to County Mayo. A great deal of this land is of a peaty nature: such land is generally believed to be deficient in minerals. Weir, in his book "Productive Soils," states: "peat soils are deficient in potassium and phosphorus." In comparing the supply of plant food elements of soil in the pounds per acre basis we observe that peats are abundantly supplied with nitrogen but are deficient in potassium and phosphorus."

This statement is borne out by Messrs. Gallagher and Walsh in a paper presented to the Royal Irish Academy in January, 1942, on "Characteristics of Irish Soil Types," Part I. Unfortunately they give no analysis of the soil in County Mayo, but we have comparable ones in Galway and a particularly bad type in Connemara. It will be noted that the ignition loss is high in these cases, even at Cornafulla, Co. Roscommon, which is of limestone origin and apparently fairly good land. The C/N ratio is also high except at Roscommon.

From February 26th, 1943, to September 23rd, 1943, 38 cases of malignant neoplasia were encountered at the abattoir. Eighteen were definitely from the West of Ireland, one from Roscommon, one from Drumshambo, Co. Leitrim, three from Kiltimagh, Co. Mayo, one from Charleston, Co. Mayo, one from Ballyhaunis, Co. Mayo; total seven. The remaining eleven, I was informed, came from the West. From Dublin County and Borough, including the Market, there were five, *e.g.*, one Dublin City, one County Dublin and three from the Market. At least one of the latter had the typical appearance of a West of Ireland cow. Co. Donegal had four cases, Counties Meath and Cavan two each, and one each from the following counties: Leix, Wexford, Clare, Louth, Longford, Monaghan and Waterford. Separating these counties into their provinces we get the following result:—

Connaught.—West of Ireland, 18 cases, 47·3 per cent.

Leinster.—Dublin Borough and County, Meath, Longford, Wexford, Leix and Louth, 11 cases, 28·9 per cent.

Ulster.—Donegal, Monaghan and Cavan, 7 cases, 18·4 per cent.

Munster.—Waterford, Clare, 2 cases, 5·2 per cent.

County Donegal, an area with a fair share of poor quality grazing land, with four cases is high. The number of cattle received from this county was very small, although I am unable to give figures.

From June 1st to September 23rd, 1943, 495 cattle from the western counties were slaughtered at the abattoir. During the same period 2,819 cattle were dealt with from the rest of Ireland. The majority of these were undoubtedly from the South.

Whilst I have only touched on the fringe of the subject I suggest that the exceptional incidence of cancer in aged cows coming from the West of Ireland warrants further enquiry as to whether cancer is a deficiency disease due to the lack of certain mineral constituents in the fodder. I am aware that the lack of potassium as a cause of cancer has been put forward a great many years ago by the late Dr. Forbes Ross, who claimed to have cured cases of it in the human subject by the administration of potassium salts. Perhaps Professor Nicholson, if he thinks there is anything in my suggestion, would consider enquiring into it. It may be argued that there is no proof that these were all cases of cancer; my answer is that, although only a small number were verified pathologically by Professor Kearney and Mr. Mullaney, I think we can safely say that, as we have had many specimens kindly examined by these gentlemen in the past, we are now sufficiently experienced to recognise the disease even if we are not always able to classify the particular type.

Finally, I would like to thank all my colleagues for their help, especially the Veterinary College staff who have been always ready to aid us in our difficulties.

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Discussion

Mr. J. M. Murphy opened the discussion as follows: I must first of all congratulate Mr. Morris on his very excellent paper. I can assure you that there is not, in this country to-day, any veterinarian who can claim to have a wider experience of emergency slaughtered animals than Mr. Morris. For over 20 years he has been daily making *post-mortem* examinations and giving judgment on the carcases of emergency slaughtered animals and I am glad he has passed on some of the benefits of his experience to other members of the profession.

I feel deeply honoured to have been asked by Mr. Morris to open the discussion on such an able paper. There is no doubt that no veterinarian can consider himself expert at meat inspection unless he has had considerable experience of the examination, and passing judgment upon, emergency cases. It is a comparatively easy matter to learn how to deal with tuberculous carcases—the regulations are laid down in the Veterinary Inspectors Order of 1929—but it is quite a different thing to be up against all kinds of emergency slaughtered animals which can be presented in so many different ways. I therefore agree with the author in encouraging both students and recent graduates to see as many such cases as possible. I do not think that there is any place in this country where one can see so many emergency slaughtered animals as at the Dublin Corporation Abattoir and so it is that this abattoir has been the schooling ground of so many of our veterinarians who to-day hold meat inspection posts. The Dublin Corporation Veterinary Staff has always been willing to allow both students and recent graduates to come to the abattoir

to widen their experience of meat inspection, and to those of you who have not had an opportunity of spending some time in this Alma Mater of meat inspection I say to you a hearty welcome awaits you.

The writer of this paper to-night has covered his field so well that he really leaves very little for me to say except to tell you that I thoroughly agree with all that he has said. I only wish that he had said more, because he has not by any means exhausted his store of knowledge of the subject.

He has ably set out the various ways in which the emergency slaughtered animal is presented.

I must here reiterate the warning given by him, that it is always necessary as a routine measure to negative anthrax when dealing with animals that are dead on arrival at a slaughterhouse. Cases of anthrax have on more than one occasion been met with at the Dublin Corporation Abattoir and, but for the care exercised, the animals might easily have been dressed there with perhaps very serious consequences.

In the vast majority of cases when the animal is dead and unbled it must be condemned, as if an animal is not bled on the point of death, then it bleeds very little and a badly bled carcase is not one that one could pass—apart from any evidence of disease or signs of putrefaction in the carcase.

With regard to animals dead and bled, a lot depends on the history of the case and the length of time the animal has been dead. If there is any evidence of *post-mortem* staining or of putrefaction one should unhesitatingly seize the carcase. Only in cases where the animal has been but a short time dead, and shows no evidence of disease, in which the carcase sets and looks normal in every way and one is thoroughly satisfied with it, should one consider passing such a carcase.

In the case of animals arriving dead and paunched, as a rule the job has not been done by butchers or those accustomed to slaughtering and handling this class of animal: it has generally been done—and very crudely—by farm hands. The pleura and peritoneum are generally soiled with blood and stomach contents. The carcase does not generally set well and its whole appearance is very objectionable and in the majority of cases the only thing to do is to seize the entire carcase.

The most satisfactory case to deal with from every point of view is that in which the animal arrives alive at the slaughterhouse and the veterinarian has had an opportunity of examining it alive. Here I would stress the advantages of *ante-mortem* inspection by the veterinary surgeon. Whenever possible, see the animal yourself before slaughter and do not rely on the history given you by the butcher. He may be honest enough but he is not trained to recognise the conditions which you will easily recognise if you examine the animal yourself. This examination often gives you the clue as to why the animal is to be slaughtered. You will recognise fractured limbs, tuberculous symptoms of either brain or spinal cord, septic conditions, mammitis, metritis, etc. No untrained person can pick these out for you. One case in point to prove the advantage of *ante-mortem* inspection stands out in my mind. I am satisfied that if I had not seen the animal alive I would have passed the carcase. It was the case of a bullock standing up in a float which arrived at the abattoir. On *ante-mortem* examination I found that the case was one of severe tetanus. What chance was there of diagnosing this condition had I not seen the animal alive?

With regard to the cases in which the animal has been slaughtered on the farm and all that arrives at the abattoir is, say, four quarters of beef, first of all examine for anthrax. Examine the quarters of beef very carefully. Ask yourself, why has this animal been slaughtered? Examine very carefully the backbone and spine for evidence of tuberculosis. Examine pleura and peritoneum for evidence of stripping, examine the carcase lymphatic glands. Examine the pelvic region, especially in cows, for evidence of staining. Remember this may well be a case of septic metritis or septic mammitis. Weigh up every consideration. In a number of cases this beef has been badly handled. Here again the animal has often been dressed by persons not expert at the job. Too often have I seen such carcases arrive in a deplorable condition. On more than one occasion I have recorded the following, "The carcase presents all the appearance of having been dressed with a slash-hook in a ditch."

I remember on one occasion Mr. Morris drawing my attention to four quarters of beef at the abattoir. It was well handled and looked like one for passing. On making a very close examination, however, it was found that on the neck on the left-hand side was a very slight swelling. On cutting into this swelling a very strong odour of camphor was emitted. The animal had probably collapsed somewhere and the local practitioner had given it an injection of camphor in oil as a stimulant. In all cases where volatile drugs have been used the carcase should be seized as these odours will undoubtedly come out on cooking.

It is also useless sending animals for emergency slaughter after insertion of iodoform pessaries into the uterus. I have come across a good few of these cases.

I well remember when a cow on my father's farm held her cleanings and I was a young graduate from the College. I took away as much of them as I could and inserted an iodoform pessary. By mischance, her milk was brought in next day for household use and I recollect all the fuss there was about the smell of iodoform from the milk, but I kept quiet until I got outside to the yardman.

In the younger animals parasitism is often the cause of poorness. Another condition causing animals to waste rapidly and which must be very toxic is a chronic pneumonia affecting the apical and cardiac lobes of the lungs. Many others waste because of tuberculosis; sometimes the lung substance may be very extensively affected and at other times enormous tuberculous livers are found. In other cases the cause of wasting is actinomycosis affecting the rumen, reticulum or omasum.

We have had in the past many animals sent into the abattoir because of acute bacillary necrosis of the liver. I will give you particulars of one case which was fairly typical. On February 4th, 1929, a heifer in good condition arrived at the abattoir dead and bled. The history was that it had been purchased the previous week. When it arrived in Dublin it was noticed to have a "chill" or "murrain" and so it missed the market. On the day it came into the abattoir it was seen to have become suddenly worse, was shivering very badly, appeared as if taking a fit and was rapidly dying. It was said to have been "bled on the point of death." On *post-mortem* examination it was found that the liver was very enlarged and inflamed, showing hundreds of necrotic foci—a typical case of acute bacillary necrosis. The gall bladder was greatly enlarged and the carcase badly jaundiced. The carcase was seized. The peculiar thing about this complaint is that it seems to have disappeared as rapidly as it came. For years now I have not seen a case of it.

We have also, at certain times, animals sent to the emergency slaughterhouse suffering from ragwort poisoning. In some seasons, many of these animals come in with typical *post-mortem* symptoms: oedema along the brisket, typical fine cirrhosis of the liver, the dropsical condition of the fat in the mesentery and petechiae in the abomasum. Other common causes of emergency slaughter are "white heifer disease," acute septic mastitis, acute septic metritis and also redwater.

Another condition which one should be on the look out for is blackleg. The author of the paper to-night has given you, in case 21, an instance of a heifer coming in alive suffering from blackleg. I have met with other cases of this disease in which the animal arrived alive at the slaughterhouse and will quote one. On January 15th, 1929, a calf arrived at the abattoir looking very sick. It could walk but was very unwilling to do so and took every opportunity of lying down. There was a very slight swelling at the side of the neck. The animal was slaughtered but did not bleed well. Blackquarter was confirmed on microscopic examination of the neck swelling: blackquarter animals, however, as a rule, arrive dead and bled at the abattoir and in some instances a very careful search is necessary to find the lesion.

One thing in connection with emergency slaughter animals has struck me as being extraordinary and it shows how strong the forces of nature are in preserving life. You all know that abscesses between the liver and diaphragm are particularly common in cattle. It is extraordinary how much pus can be held up and under what pressure it can be in these abscesses and yet the beast seems to thrive well and show no symptoms. The extraordinary thing is that only once in 20 years' experience have I seen an animal brought in for emergency slaughter on account of one of these abscesses having burst during life.

I will now pass on to the second portion of Mr. Morris's paper, namely, "The Incidence of Malignant Neoplasia in the Bovine" and its relationship to the county of origin.

In dealing with this I may say that I have always been interested in the occurrence of malignant tumours in cattle. We hear a good deal about the danger of man contracting tuberculosis from cattle through milk, but I have often wondered what is the danger of man contracting cancer from animals. A common site for cancer in cattle is the eye socket. You all know what a fearful stench there can be from these eyes, and how objectionable they look. Another very common site is the liver; in fact it is a much more common site than the orbit. I have never felt too happy about passing the carcase of a beast in which a malignant neoplasm is present in an internal organ. Our regulations say that the entire carcase should be seized for malignant neoplasms, unless they are localised, in situation and effect, to one organ. Granted the neoplasm may be localised in situation to one organ, but is the condition localised in effect? Would any other portion of the carcase or viscera, the blood or the lymph be also affected even though no naked-eye lesion can be seen? I have always been very careful to have the blood of an animal affected with a malignant neoplasm discarded and have always made sure that it is not allowed to go for making black puddings, etc. I have made a practice also of discarding all the viscera of an animal in cases where the carcase, according to regulations, may be passed.

In dealing with these animals in the slaughterhouse always make a very careful search for evidence of metastasis and if you find any evidence of it seize the entire carcase and viscera.

In cases of cancer of the eye, search very carefully in the lungs and sometimes you will find a lesion there. Sometimes in carcinoma of the liver one also finds secondary lesions in the lungs. Always palpate these organs carefully and if there is any evidence there then discard the entire lot. One also often meets with a malignant tumour in the mesenteric lymphatic glands; occasionally the bowel is affected.

I have seen several cases of malignancy in cattle where in addition to the lungs and liver being extensively affected, the growth has spread along both pleura and peritoneum. Both these serous membranes can be very extensively affected and the condition can be easily mistaken at first sight for tuberculosis. I well remember the first few of these cases I came across. I, at first, thought they were tuberculous but on examination of the ordinary lymphatic glands of the viscera I could find no lesion of tuberculosis. This gave me the first indication that these cases were not tuberculous. I then took specimens of these lesions to the Veterinary College and they were reported as adeno-carcinoma. I soon became expert at diagnosing this condition and now I find no difficulty in differentiating it by the naked eye from tuberculosis.

I am satisfied that carcases have from time to time in the past been seized as being tuberculous when the condition in fact was one of malignancy affecting the serous membranes. The judgment made no difference as the carcases should have been seized in any event.

The incidence of malignant neoplasms in cattle undoubtedly varies in different areas of this country. Just as those who have made *post-mortem* examinations on thousands of cattle from various areas are in a position to state the areas heavily and lightly affected with tuberculosis, so also they are in a position to state the areas in which malignant tumours are the more common. My experience has been that these neoplasms are common in the west of Ireland among old cows and I have also found them very common in animals coming from Cavan and Monaghan areas. They are not very common in cows from the southern counties. The impression created in my mind is that malignant neoplasms, of which the commonest form is carcinoma, are found in cattle coming from districts where the land is poor. Thus the question arises in my mind, does lack of certain elements in the soil and hence the food of cattle constitute a predisposing cause of cancer?

J. E. Kenny: I wish to be associated with the previous speaker in congratulating Mr. Morris on his very able paper. The subject of bovine neoplasia is one which has been of especial interest to me for a number of years past. As most members present are aware, local authority veterinary inspectors are required under the provisions of the Bovine Tuberculosis Order (1926) to forward to the Veterinary Research Laboratory, Thorndale, specimens of the lesions found on *post-mortem* examination in the case of all animals slaughtered under this Order. During the period 1932-40, 21,592 bovines were so slaughtered and on subsequent laboratory examination of the viscera it was found that 214, or approximately 1 per cent., of these animals showed the presence of neoplasms.

I was particularly interested in the statements of the reader and opener of the discussion relative to the variation of incidence in different counties and areas. Early in the investigation carried out at the Veterinary Research Laboratory, Thorndale, it was noted that there were wide variations in the percentage of tumours among the specimens received from the different areas and I was very anxious to get more data on this point. In his book "The Cause of Cancer," D. Brownlie, B.Sc., states, "Some counties also, such as Devon, suffer more from cancer than others." I communicated with this author seeking further information on this point and although unable to obtain exact data was informed that such statements regarding the alleged increased prevalence of cancer in certain areas in Great Britain, including Devon, have appeared repeatedly in the literature and daily press during the past half-century. Mr. Morris has given a geographical outline of the areas in Eire which he considers to show a greatly increased prevalence of neoplasia.

While agreeing that the majority of the tumours spreading superficially over the peritoneum or pleura are carcinomata it should not be forgotten that tumours of a sarcomatous or lymphoid nature are not uncommonly found in these situations.

There are two points on which I would like to know if Mr. Morris's experience coincided with my own. Most authors in describing live neoplasms met with have stressed the point that the majority of their cases were associated with cirrhosis, but my experience was that there was no constant relation with cirrhosis; in fact, only 30 per cent. of tumours of hepatocellular type were associated with even slight cirrhosis. Perhaps in the past there was too great a tendency to blame the liver fluke. The second point refers to the question of co-existent tuberculosis and neoplasia. My experience was that this was of rare occurrence. It is considered worthy of mention that although 17,705 of the specimens previously referred to showed tuberculous lesions and, as stated, 214 cases of neoplasia were encountered, co-existent neoplasia and tuberculosis were present in only ten instances.

[Other contributors to the discussion included Senator O'Donovan, Messrs. Cosgrave, Mullaney and Nolan, and Professors Kearney and O'Connor.]

The Reply

Mr. Morris, in reply, thanked the members for the reception they had given his paper.

To Mr. J. M. Murphy he offered his heartiest congratulations for the able manner in which he had opened the discussion. He, Mr. Morris, agreed with him on the necessity for seeing the animal prior to slaughter and the case of tetanus to which

Mr. Murphy referred was a particularly apt example. He was very grateful to Mr. Murphy for having let him off so lightly in his criticism; the only point at issue was the presence of *post-mortem* staining. Mr. Murphy would apparently condemn any carcase showing this condition. He (Mr. Morris) would be prepared to pass a carcase showing slight staining on the diaphragm provided it conformed in every way with that of a normal carcase. Mr. Murphy's amusing reference to his use of an iodoform pessary and its effect on the milk was worth remembering; in fact, the use of any of the volatile drugs must be considered in judging the emergency carcase. Mr. Murphy also reported a number of other interesting cases. He (Mr. Morris) thoroughly agreed with him as to the danger of mistaking endotheliomata of the serous membranes for tuberculosis. He was glad that Mr. Murphy agreed with him that cancer would appear to be a disease due to lack of certain elements in the soil.

With Senator O'Donovan he agreed that in recent years they had found that actinomycosis of the reticulum was probably a more common cause of tympany of the rumen than tuberculosis. He also agreed with him regarding the danger of missing a tuberculous meningitis, but he did not think that acute *B. necrosis* infection had vanished as only a couple of weeks ago he had such a case. He agreed that "streptococcal endocarditis" was an interesting condition and particularly the case referred to—showing small abscesses in the muscles. Mr. J. Kenny's report of the number of cases of neoplasia examined by him was very interesting and also the fact which he had noted and with which he (Mr. Morris) thoroughly agreed, *i.e.*, no tuberculosis = cancer; cancer = none or very little tuberculosis. Mr. Kenny's findings that malignancy of the serous membranes had been frequently of a sarcomatous nature had not been his experience.

Mr. Cosgrave's lucid description of his anthrax outbreak pointed to the danger of slaughtering sick animals on farms without veterinary supervision.

Mr. Mullaney took him to task for his method of examining for anthrax. He still thought that from a practical point of view the old method was the better, particularly as at the abattoir the carcase was not allowed to be removed from the vehicle until anthrax had been negatived. He did not think true caseous lymphadenitis occurred at the abattoir but they frequently got the caseo-purulent pleurisy type which he understood was generally due to *B. purifaciens*. Mr. Mullaney strongly favoured the "irritation theory" and referred to "fluke" as a cause of neoplasia, but this had not been his experience.

Mr. Nolan had agreed that "fluke" had very little to do with the incidence of cancer and he (Mr. Morris) thought his suggestion that cancer should have been included in the list of diseases in the scheme submitted to the Ministry of the Department of Agriculture was a good one. He could not agree with Mr. McClancy's statement that he knew practitioners who could diagnose 98 per cent. of tuberculous cases.

Professor Kearney preferred the theory that cancer was genetic or inherited in nature rather than due to mineral deficiency—this was possible, but still there was no doubt that cancer in cattle in this country was a disease of poor land. Professor Kearney regretted that he (Mr. Morris) did not have all his cases examined histologically. This was unfortunately true, but he (Mr. Morris) believed that he had seen so many cases of cancer in the past that he could now recognise the condition: also all cases referred to in his cases were accompanied by "metastasis." Finally, Professor O'Connor gave an example showing the necessity of using proper containers for carrying suspected anthrax material.

REVIEW

[Practical Veterinary Pharmacology, Materia Medica and Therapeutics, by Howard Jay Milks, D.V.M. (Fifth edition.) pp. xi. 674. 33 illustrations. Baillière, Tindall & Cox, 8, Henrietta Street, W.C.2, price 37s. 6d.]

The latest edition of this standard American text-book brings an already useful volume as nearly up-to-the-minute as is possible in times of such rapid progress in the world of therapeutics. Additional drugs discussed in this new edition include phenothiazine, sulphadiazine, sulphaguanidine, phenyl mercuric nitrate preparations, nemural and others, whilst an entire new chapter is now devoted to the sulphonamides.

Details are given very fully in all sections, the drugs being classified according to their pharmacological actions. The preparations given are naturally those of the United States Pharmacopoeia and National Formulary, not of the British Pharmacopoeia, but the data provided forms a valuable fund of information.

Certain of the dosages (which are given in the Apothecaries' System) recommended differ from those commonly in use in this country, examples being ol. chenopodium and the newly included taeniacide, nemural, the suggested doses in each case being considerably larger than those considered both safe and effective over here, *e.g.*, the dose of nemural is given as one tablet (presumably of 18 mgm., although this is not stated) per 8 lb. body weight.

Allowing for these minor points of difference, this book should prove most valuable to practitioner and student alike, providing for the former an excellent, comprehensive and up-to-date source of reference, and for the latter a well arranged and readable text-book, its value in this connection being enhanced by the inclusion of chapters dealing with dispensing in a manner at once readily comprehensible and practical: included in this section are several really helpful diagrams.

When it is recalled that the date of publication of this edition is the fourth year of war it is gratifying to find a book of this type so well produced, both paper and binding being of good quality.

Weekly Wisdom

"Experimental science has three great prerogatives over other sciences; it verifies conclusions by direct experiment; it discovers truth which never otherwise would be reached; it investigates the course of nature and opens to us a knowledge of the past and of the future."—Roger Bacon.

CLINICAL COMMUNICATION

The Use of Sulphanilamide Impregnated Gauze

L. R. GEFFEN, M.R.C.V.S.
Kensington, W.8

In view of the success of a dressing which has been used in human practice for the treatment of burns, wounds and scalds, the following instances of its use in veterinary surgery may be of interest.

The preparation is a wide mesh gauze, ten strands to the inch, impregnated with 10 per cent. sulphanilamide in a soothing greasy base.

1. Boxer Bitch. This animal had an abscess on the dorsal aspect of the neck about two-and-a-half inches long. The abscess was incised, drained and plugged with about two feet of the gauze and bandaged. Three days later the gauze was withdrawn. The wound was clean, free from pus formation and showed healthy granulation. Further treatment was with dry dressings. Recovery was rapid and uneventful.

2. French Bull Bitch, 13 years. This dog had an ulcerating growth on the back about two inches anterior to the root of the tail. The growth was dissected away, using procaine anaesthesia. The skin was so tight as make suturing difficult. The wound was plugged with the gauze and bandaged. It healed by granulation and by the tenth day hair was beginning to grow.

3. Mongrel Terrier. This dog had been bitten on the leg in a fight three days previously. The leg was swollen from the knee to the hock. A counter opening was made in the hock region, the pus drained and the wound plugged through with the gauze, the latter being removed on the third day. Recovery was uneventful.

4. Cat. The near fore foot was crushed; haemorrhage was severe, but no bones were broken. The foot was cleaned and dressed with gauze and bandaged. Recovery was rapid.

5. Field Spaniel. This dog had trodden on a broken bottle, causing a deep puncture wound in the tarsal region from which arterial blood was spurting. A tourniquet was applied, the dog was anaesthetised and the artery was dissected out and ligatured with catgut. The muscle and skin wounds were closed with silk, a dressing of the gauze applied and the leg bandaged. On the fifth day the leg was examined, when it was found that healing by first intention had taken place, and the stitches were removed.

6. Female Cat. This cat was spayed in the usual manner by a flank incision and the muscle layers sutured with silk. The skin was sutured with silk and not silkworm gut as is my usual procedure, and so, as a precaution, a pad of the gauze was placed over the operation site and a bandage applied. Healing was by first intention.

I am satisfied from these and other results and from cases reported to me by a colleague that the dressing constitutes a distinct advance in veterinary surgical treatment. Healing was undoubtedly accelerated and in cases in which delayed healing by second intention would normally have been expected, healing without any signs of sepsis occurred. (The dressing used was sulphanilamide tulle, "Optrex" brand.)

ABSTRACT

[An Improved Flotation Method for the Recovery of Ova from Faeces. Eigenfeld, D. D., and Schlesinger, C. J. (1944.) *J. Amer. vet. med. Ass.* **104**. 26. (1 Text-fig.).]

The method includes the use of a 6 in. by 1 in. test-tube which is drawn out by heated forceps into a small side-arm directed towards the closed end of the tube, after being softened by flaming about 2 inches from the open end. The spout-like side-arm is cut at a convenient level to give at least a $\frac{1}{4}$ inch diameter opening. In use, faeces suspended in brine, zinc acetate or other flotation solution are placed in the tube almost to the side-arm level as well as a funnel whose stem reaches to the bottom of the tube. After enough time has elapsed for helminth eggs or amoebic cysts to float to the surface of the fluid, sufficient flotation solution is introduced *via* the funnel to permit 2–4 c.c. of the surface layer to spill over into the side-arm where they are caught in a centrifuge tube. 10 c.c. distilled water are thoroughly mixed with the faecal suspension in the centrifuge tube which is then spun for a few minutes and the sediment examined for eggs or cysts.

J. N. O.

IN PARLIAMENT

The Principle of Sex Equality in Salaries

Ordinarily in this column probably we should not under present conditions devote space to more than a bare record of the fact that after an animated debate in the House of Commons on Tuesday of last week an amendment to the Education Bill, demanding equal pay for men and women teachers, was carried against the Government by one vote—117 against 116. The interest of the profession in this matter, however, undoubtedly is enhanced by the fact that, not as a coincidence but as a sign of the times, the principle involved, that of sex equality in salary payments, was raised on the report of the Appointments Committee of our own Council at its last meeting—the proceedings of which will be published in our next supplement. Appropriately, the question came up on a communication from a lady Member, and the ultimate resolution of Council, on the recommendation of the Committee, was in favour of adoption of the principle that, since there is a uniform standard of education and training for both men and women members of the profession, there should be no discrimination in salary in all public appointments for veterinary surgeons. In concluding this interpolation it may be recalled that the principle of equal pay for equal work has been before the country for at least a quarter of a century and has been twice accepted by the House of Commons in regard to the Civil Service.

The division in the House came at the end of a long debate opened by Mrs. Cazalet Keir, who moved the amendment providing that in approving teachers' salary scales the Minister should not differentiate between men and women solely on the grounds of sex. It was obvious that she had considerable support in all quarters of the House.

Mr. Butler explained that he could not advise that the amendment should be inserted in the Bill, since it would place him in an entirely false position in relation to the Burnham machinery, which had worked extremely well.

At this point he was interrupted by Sir H. Holdsworth and Lady Astor with a suggestion to the effect that he should give a lead on the question.

Mr. Butler retorted that if members did not like the lead which he was giving them they could find somebody else to give them one. If the Burnham Tribunal, he said, which represented both teachers and local authorities, decided that it was right to have equal pay for men and women for equal work, let them make a submission to him, but he had no evidence that they desired such a change. He then appealed to the House not to force him to put in the Education Bill a provision on equal pay for men and women which had not yet been decided as a national question. He promised to discuss the matter with the Chancellor of the Exchequer.

The debate went on in a well-filled House with considerable animation. Sir Archibald Southby, from the Conservative side, was in favour of the principle of equal pay for men and women for work equally well done, and Mr. Cove, from the Labour benches, told the House, from his knowledge of the teaching profession, that virtually all the teachers endorsed that principle.

Eventually Mr. Butler, who now had Mr. Eden, the Leader of the House, by his side, rose to express his anxiety about the progress of the Bill. He was unable, however, to add to what he had already said, although he realised the strong feeling which members felt on the subject at issue. The House, he protested, was really putting him in a most difficult position. He repeated his undertaking to confer with the Chancellor of the Exchequer so that the general issues raised by the amendment could be considered before the special position of the teachers was dealt with. He also stated that he would see that the question was considered through the Burnham machinery. But, as to the amendment, Mr. Butler declared that he could not undertake to do what he was unable conscientiously to carry out.

This did not satisfy the House, which, after some further discussion, went to a division, with the result already stated.

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Questions

Hill Sheep Industry

Mr. Snadden asked the Secretary of State for Scotland whether the Government propose to introduce legislation to give effect to the recommendations of the Balfour Committee on the Hill Sheep Industry.

Mr. Johnston: I am presently engaged in discussions with the Scots hill sheep industry upon certain aspects of the recommendations contained in the Report of Lord Balfour of Burleigh's Committee. I expect to have the considered views of all sections of the industry at an early date, and I shall then consider, in consultation with my right hon. Friend the Minister of Agriculture, who has before him a report on the industry in England and Wales, the measures which might most suitably be adopted.

Mr. Snadden: Will the right hon. Gentleman afford an opportunity for discussion in the House on that report?

Mr. Johnston: Prior to the introduction of legislation?

Mr. Snadden: Yes.

Mr. Johnston: That is a question which must be put to the Leader of the House.

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Artificial Insemination Centres

Mr. Vernon Bartlett asked the Minister of Agriculture how many licences for artificial insemination centres have already been issued; and what steps are being taken to ensure that they are most usefully located.

Mr. Hudson: Five artificial insemination centres, including the two experimental centres at Cambridge and Reading, have so far been licensed. With regard to the latter part of the Question, a small Departmental Committee is considering the lines on which any future development, including the location of artificial insemination centres, should be planned and controlled.

Mr. Bartlett: May I take it that the Minister will do his best to see that this system, which may be of benefit to agriculture, is under the very careful control of experts?

Mr. Hudson: Yes, Sir, that is why I have set up this Departmental Committee to control its effect.

Sir J. Lamb: Will the Minister take care that these methods do not come under commercial control?

Mr. Hudson: That is one of the objects in the minds of my Committee.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Apr. 12th.—Meeting of the North Wales Division, N.V.M.A., at Ruthin, 2 p.m.
Apr. 12th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.
Apr. 12th.—Annual General Meeting of the National Veterinary Benevolent and Mutual Defence Society, at Manchester, 3.15 p.m.
Apr. 12th and 13th.—Annual Conference of the Association of Veterinary Students of Great Britain and Ireland, at Edinburgh.
Apr. 19th.—Meeting of the Comparative Section of the Royal Society of Medicine, 1, Wimpole Street, W.1, 2.15 for 2.30 p.m.
Apr. 21st.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool, 2.30 p.m.
Apr. 27th.—Annual General Meeting of the Association of Veterinary Inspectors, in London, 2 p.m.
Apr. 28th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds, 3 p.m.
Apr. 29th.—Meeting of the Society of Women Veterinary Surgeons, in London, 2 p.m.
May 9th.—**R.C.V.S. Council Election.** Last date for receipt of nominations.
May 11th.—Meeting of the South-Eastern Division, N.V.M.A., at Tonbridge, 2.30 p.m.
May 22nd.—R.C.V.S. Council Election. Voting papers issued.
May 30th.—R.C.V.S. Council Election. Last day for receipt of voting papers.
June 6th.—**R.C.V.S. Annual General Meeting.**
June 7th.—R.C.V.S. Committee Meetings.
June 8th.—**R.C.V.S. Council Meetings.**
June 27th.—R.C.V.S. Examinations begin (provisional date).

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NATIONAL HEALTH AND UNEMPLOYMENT INSURANCE

Members of the profession are reminded that employees under 65 years of age whose remuneration does not exceed £420 per annum (including the value of board and lodgings) must be insured under both the National Health Insurance Acts and the Unemployment Insurance Acts.

PERSONAL

Birth.—MORGAN.—On March 30th, 1944, at Home Farm Maternity Home, Tring, to Hélène, wife of J. B. Morgan, M.R.C.V.S., a daughter (Jennifer).

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R.C.V.S. OBITUARY

THE LATE MR. FREDERICK CROWHURST, M.R.C.V.S.

Mr. Frederick Crowhurst, whose death at Marden, Kent, we recorded with much regret in a recent issue, was President of the South-Eastern Veterinary Medical Association for three years. He was a member of the National Veterinary Medical Association, also of the Society of Veterinary Practitioners. Mr. Crowhurst, who served in the R.A.V.C. as a captain in the last war, was the brother of Mr. Cecil Crowhurst, veterinary surgeon, of Maidstone.

The funeral service at St. Michael's and All Saints', Marden, was conducted by the Rev. J. A. Finch. Interment followed at Maidstone Cemetery.

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LIVESTOCK REPLACEMENT IN EUROPE

Livestock replacement in Europe may prove the most serious problem facing Continental agriculture after the war and, therefore, deserves particular attention in any comprehensive reconstruction programme. After the last war it was the least difficult problem that was presented.

This is the final conclusion of a report* by the League of Nations organisation at Geneva on agricultural production in Europe during the 1914-18 war and the reconstruction period, says the *Farmer and Stock-Breeder* in its review.

It is a report of value to those who, directly or indirectly, may be concerned in the planning of agricultural reconstruction, especially since history's tendency to repetition may afford guidance to what may occur after the present struggle ends.

One of the general conclusions reached is that fundamentally the agricultural position of Europe is already weaker to-day than after the last war, and is bound to weaken further the longer the war lasts.

As nearly the whole of the Continent is now involved the need for initial relief from overseas and for assistance in reconstruction will be the greater and the more urgent. Failing such assistance, the process of recovery may be even slower and more painful than it was last time. And it took some seven years after 1918 for the Continent to restore its food production to the pre-war level.

What happened after 1918 in regard to livestock was that the number of cattle declined fairly uniformly around an average of less than 10 per cent. in most of France, in Switzerland, and the Netherlands, and in Germany with the exception of two regions of high cattle density, Bavaria and Schleswig-Holstein, where numbers actually increased between 1913 and 1919. Only in the battlefield areas (including Belgium) and in a few other French districts, principally in Southern France, did the decline exceed 20 per cent.

Losses in the battlefield areas were made good by about 1924. Elsewhere on the Continent recovery was on the whole relatively slow, the reconstruction of cattle herds by natural growth being necessarily a lengthy process.

Numbers of pigs not only declined greatly but declined much more in some districts than in others. In 1919 there were only about 30 per cent. of the pre-war number of pigs in the region stretching along the coast from Holland to Denmark. In a belt extending from Bavaria through Switzerland to the Cevennes there were from 60 to 80 per cent. of the pre-war numbers.

The number of pigs recovered rapidly in all districts, although it lagged slightly in France, Hungary and Transylvania by comparison with Germany.

Sheep increased during the war in Western and Southern Germany and in Switzerland, fell elsewhere in Europe, and fell greatly in France. The situation did not change much until 1924 or 1925, when the numbers declined rapidly in Germany also. A tendency is apparent for sheep numbers to grow in Southern relative to Northern Germany.

*Agricultural Production in Continental Europe during the 1914-18 War and the reconstruction period, League of Nations, published by Allen and Unwin, London, W.C., 7s. 6d.

MORE LIGHT ON THE B COMPLEX FROM PIG EXPERIMENTS

"In 1940 Van Etten and others[1] found that the administration of an ample supply of crystalline vitamin B_1 did not prevent convulsions and nerve degeneration in swine fed on autoclaved liver and whey. The experiments of Wintrobe[2] carry the matter a stage further, with an accurate description of symptomatology and pathology in pigs receiving all the known members of the B complex except B_1. The earliest clinical manifestations were failure of appetite and vomiting, followed by cyanosis, dyspnoea and bradycardia, and ending with a severe degree of heart failure or sudden death. No abnormality of neuro-muscular disturbance, such as ataxic gait, was ever observed. Careful histological examination of the nerve tissues, central and peripheral, gave no evidence of degeneration or inflammation, but in practically every case local necroses of the myocardial fibres were present in both auricles and ventricles. Where the pathological condition had not advanced too far, administration of B_1 led to recovery. Of particular interest are the biochemical findings. The concentration of carbonyl compounds estimated as pyruvic acid was proportional to the degree of severity of the deficiency as judged by the clinical manifestations. A sharp rise in blood pyruvic acid was quickly followed by the rapid progress of the disease. It was also found that a significant increase in blood pyruvic acid after the administration of glucose always occurred in B_1-deficient animals but not in the control group. As for urinary content of B_1, it reflected—but by no means consistently—the dietary intake immediately before the collection of urine. Of more value in assessing the degree of B_1 deficiency was the percentage retention of B_1 after a given dose. This test, suggested by Najjar and Holt,[3] gave results which ran parallel with the clinical findings and the amounts of B_1 in the diet.

"It is clear from this work that the position of vitamin B_1 as the antineuritic vitamin has been strongly assailed, supporting the sceptical view put forward by Meiklejohn[4] in 1940. He concluded his review with the statement that probably a multiple deficiency is responsible for nutritional neuritis but that there is still a possibility that the true antineuritic vitamin has yet to be discovered. By the use of crystalline vitamins Wintrobe and his colleagues have shown that neither riboflavin nor nicotinic acid has any effect in maintaining the integrity of nervous tissue.[5] It was then found that the ataxic gait and the degenerative nerve lesions brought about by a dietary deficiency of the vitamin-B complex are completely prevented by whole desiccated liver.[6] The anti-pernicious-anaemia fraction was found to be the most potent of the individual liver fractions, none of which are as efficacious as whole liver, even when given parenterally, and the results suggest that there is a need for passage of the nerve-protection factor through the gastro-intestinal tract. Finally it has been shown[7] that the dietary deficiency of either pyridoxine or pantothenic acid leads to an ataxic gait in swine and degeneration of sensory neurons which could invariably be prevented by the administration of these substances. The claim of one of these constituents of the vitamin-B complex is considerably strengthened by the finding that the protective actions of the various liver fractions is proportional to their contents of pantothenic acid."—*Brit. Med. J.*, 1944, January 15th, p. 85.

(1) *J. Nutrit.* 1940. **20**. 607.
(2) *Johns Hopk. Hosp. Bull.* 1942. **71**. 141.
(3) *Ibid.* 1940. **67**. 107.
(4) *New Engl. J. Med.* 1940. 223. 265.
(5) *Johns Hopk. Hosp. Bull.* 1940. **67**. 377.
(6) *J. clin. Invest.* 1942. **21**. 71.
(7) *J. Nutrit.* 1942. **24**. 345.

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Subject to modifications, the scheme operating in 1943 for the payment of subsidy for cattle kept on hill land in England and Wales will be continued for another year. The objects of the scheme are primarily to secure improvement of grazings on hill farms and to encourage the breeding and rearing of more cattle on such land.

* * * * *

Suffolk sheep breeders, at their annual meeting in London, passed two resolutions relating to the position of sheep generally in our war-time farming operations. The first expressed alarm at the poor quality of ram lambs of all breeds that were being sold for stud purposes, and urged that the National Sheep Breeders' Association should at once take action towards effecting an improvement. The second was to the effect that Mr. Hudson be asked to encourage the keeping of sheep for the double purpose of restoring fertility to the land and for the provision of meat which is becoming so scarce as to lead to demands by the Government for increased production.

BIOTIN

Another vitamin in the B-complex, biotin, is now available in synthetic form, ending investigations which originated over 40 years ago and opening further wide fields in biological and clinical research.* Biotin has a less spectacular history than many of the other vitamins and, while it has been the subject of investigations for many years, it was not studied as a substance of importance in animal nutrition but rather as a growth factor for yeasts. In 1901, a Belgian scientist, Wildiers, found that yeast inoculated into a medium containing fermentable sugars and certain organic salts would not grow or produce fermentation unless wort or similar sterile extracts were added. This organic, heat-stabile substance that must be present to ensure yeast growth was known as bios.

Little attention was paid to the findings of Wildiers until, in the late 20's, investigations were directed toward certain growth factors. The separation of bios into various factors was accomplished and the active material was named biotin.

Meanwhile, investigators found that large amounts of raw egg white, when fed, were toxic, but that this toxicity was lost by cooking the egg white or by feeding substances such as dried liver or dried yeast. This protective factor was isolated from liver and yeast by György and identified as vitamin H. (Further studies have shown that "egg-white injury" is due to the "locking up of the organism's available supplies of necessary biotin by fixation with avidin [a special constituent of egg white]. This mechanism of egg-white injury appears to represent a hitherto unknown principle in the production of disease.") Now investigations have proved that vitamin H and biotin, as well as co-enzyme R, are identical substances.

Unlike other vitamins, biotin is of universal occurrence but it occurs only in minute traces. No less than 360 tons of yeast would be required to produce one gramme of biotin. Egg yolk is ten times richer in biotin than is yeast, but it would cost about $5,000,000 to purchase enough newly laid eggs to prepare one ounce of crystallised biotin.

Biotin, however, must be ranked as one of the most potent physiological factors known. Diluted two parts per 100,000,000,000, it produces a marked physiological activity. Thus the urge to provide synthetic biotin was great not only because of the impossibility of producing any quantity from natural sources but also because large quantities are necessary in order to learn its manner of action as a cell growth factor and its effect on living things.

Future research with biotin may centre about the mechanism of the normal and abnormal growth of the animal cell. Other problems are also concerned. Since biotin is one of the powerful growth vitamins in the B-complex, pathological effects due to nutritional deficiencies must be considered. Biotin deficiency is produced in rats on diets containing sulpha drugs and with the wide use of these drugs, the importance of the mechanism of this action and a correlation of investigations on vitamins and sulphonamides cannot be overlooked.

* Addinall, C. R.: The isolation, structural determination and synthesis of biotin. Merck Report (July, 1943) 4-7. Quoted by *The North American Veterinarian*, **24**. 618.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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THE ONE-PORTAL SYSTEM AND THE COMING R.C.V.S. ELECTIONS

Sir,—Having regard to the extreme importance which a large number of the profession attaches to the retention of the one-portal system of entry into the profession, I suggest that candidates for the forthcoming elections should express their views concisely and clearly on the matter. We do not want to be told that a candidate is in favour of *a* one-portal system of entry into the profession, but that he (or she) is in favour of *the* one-portal system as we know it, with the Council of the R.C.V.S. composed of veterinary surgeons elected from the profession, and not diluted by representatives of other bodies or institutions. Those who feel as I do, and who believe that the one-portal system *as we know it* should be retained, should refrain from voting for any candidate who has not clearly and unequivocally declared himself to be determined to support its retention.

Yours faithfully,

Penzance. S. J. Motton.

March 19th, 1944.

* * * * *

Sir,—On reading through the correspondence in the *Veterinary Record* of March 18th, one is struck by the clever and rather convincing dialectics of a number of the members of the veterinary profession. But does not it all show the truth of Pope's dictum that

"Worth makes the man, the want of it the fella;
The rest is merely leather or prunella."

I have often thought that if *the percentage* of the rank and file from the universities who achieved distinction was reckoned up it would not be a very brilliant one. I think, too, that a splendid enlightening article could be written on the subject of "Business *versus* Science." Many noble and eminent men have originated from the universities, but everybody does not want to become a University Professor, and as regards usefulness in everyday life the offspring of colleges and public schools will run them very close and open competition is good for education.

Yours sincerely,

G. Mayall.

COLONIAL VETERINARY SERVICE

Sir,—I think it is permissible to ask Mr. J. L. Stewart what recommendations he has made to the Governor of the Gold Coast, and through him to the Secretary of State for the Colonies, for the recruitment of adequately trained Veterinary Officers.

New Veterinary Officers for West Africa might attend a course at the Vom Veterinary School. New Officers might attend the Administrative Officers' course at a university for one year, followed by a year at the veterinary school in the tropics, before taking up their duties. After one or two tours, Officers might be encouraged to take a refresher course in the subjects in which they have found their main interest either at home or at another suitable centre.

The Overseas Committee of the N.V.M.A. has these points under review. The Committee does, and has done, excellent work and members of the Colonial Veterinary Service should avail themselves of the invitation of the Committee to attend meetings as opportunity occurs.

Yours faithfully,

A. W. Hart,
Veterinary Officer, Nigeria, on leave.

28, Kingsway,
Liverpool, 22.
April 3rd, 1944.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
Mar. 1st to 15th, 1944 ...	8	10	1	4	25
Corresponding period in—					
1943 ...	18	1	1	10	17
1942 ...	11	1	4	7	14
1941 ...	24	38	1	5	66
Total Jan. 1st to Mar. 15, 1944	54	13	4	50	122
Corresponding period in—					
1943 ...	76	10	3	74	103
1942 ...	67	11	13	87	87
1941 ...	112	115	5	79	506

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.